

**UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF ILLINOIS**

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| UNITED STATES OF AMERICA, |) | |
| |) | |
| Plaintiff, |) | |
| |) | |
| v. |) | Case No. 05-CV-242-DRH |
| |) | |
| APEX OIL COMPANY, INC., |) | CJRA Track: C |
| |) | |
| Defendant. |) | Hon. David R. Herndon |

**APEX OIL COMPANY’S MEMORANDUM IN OPPOSITION TO PLAINTIFF’S
RENEWED MOTION TO STRIKE THE TESTIMONY OF DR. ERIC L. BUTLER**

Introduction

The United States’ Renewed Motion to Strike Testimony of Dr. Eric L. Butler (“Renewed Motion to Strike”) (Dkt. 181) offers even less substance than the earlier Motion to Strike Testimony of Dr. Eric Butler (“Motion to Strike”) (Dkt. 91), filed August 11, 2006. In that Motion to Strike, Plaintiff argued, albeit erroneously, that there was no published science to support Dr. Butler’s opinions concerning vapor fingerprinting. In its Renewed Motion to Strike, Plaintiff does not seriously challenge the existence of scholarly support for Dr. Butler’s methodology. Indeed, the scholarly support for Dr. Butler’s methodology and opinions are not mentioned or discussed at all. Instead, the Court is given what amounts to no more than the opinions of Jeffrey Spector on the validity of Dr. Butler’s opinions. Plaintiff’s failure to address this authority, without more, should lead to a denial of its motion.

But there is more. Dr. Butler, whose undergraduate degree was in chemistry and whose Ph.D. was in chemical oceanography, is an experienced environmental chemist whose work at Gradient Corporation over the last dozen years has involved substantial work in environmental forensics, involving not only the nature and extent of environmental contamination but also the sources. (Trial Tr. Day 12 am, p. 49, l. 19 - p. 60, l. 19). Dr. Butler’s extensive experience in

environmental forensics was spelled out in his testimony. (*Id.*). Because Dr. Butler's experience had been covered extensively in the prior briefing on Plaintiff's unsuccessful Motion to Strike, Apex Oil also marked as evidence Dr. Butler's Declaration, submitted in opposition to the Motion to Strike. This was admitted as Defendant's Exhibit 1000. (To avoid duplication, the extensive attachments were omitted in Def. Ex. 1000; they are found in the Court file at Dkt. 84, filed 08/28/06). Dr. Butler's testimony and Declaration described his wide ranging experience and expertise, ranging from the study of water quality in the Exxon Valdez oil spill, on which he worked for two years with detailed chemical analyses of the environmental samples and impact from that spill, to identification of sources of petroleum hydrocarbons and chlorinated solvents at a Superfund site, and planning and implementing groundwater monitoring activities at landfills, petroleum spills and suspected hazardous waste sites for municipal governments in Massachusetts. (Trial Tr. Day 12 am, p. 49, l. 19 - p. 60, l. 19; Def. Ex. 1000, ¶¶ 1-3). These projects frequently involved the movement of contaminants in soil and groundwater and Dr. Butler has done this kind of work on more than 50 projects in his career. (*Id.*). While, Dr. Butler's correlation analysis of water table and indoor air complaints was not significantly different in principle than the correlation analyses of Mathes and ESI and by Hartford Working Group contactors relied on heavily by the plaintiff, Dr. Butler's analysis was more thorough, was backed up by chemical and scientific training, and was defended in Court. Plaintiff's approach to this correlation analysis, wherein it rejects Dr. Butler's analysis, but embraces the same kind of analysis performed set forth in reports whose authors are not identified or who have no training in chemistry or environmental forensics at all, shows it is really quibbling with the result of his analysis and not its legitimacy.

For these reasons, as set forth more fully herein, the Renewed Motion to Strike should be denied.

Discussion

I. Opinions 4 and 5. Dr. Butler's comparison of vapors underneath the Hartford Community Center and inside of East Watkins Street homes in May 2002, respectively, with samples collected from above the LNAPL pool and his determination that the vapors and LNAPL have an inconsistent chemical composition represents a routine exercise in chemical fingerprinting, is well established and is the product of a reliable methodology.

Dr. Butler's Opinions Four and Five employ the same general methodology. The methodology behind Dr. Butler's vapor fingerprinting analysis is well established. The usefulness of the technique is discussed in an article cited in Dr. Butler's report (Def. Ex. 586, p. 21, bibliography), discussed at trial (Trial Tr. Day 12 pm, p. 54, l. 12 - p. 56, l. 15) and in his Declaration (Def. Ex. 1000, ¶7) (attached to the Declaration were excerpts from Dr. Butler's deposition, wherein this authority was discussed; Dr. Butler's Declaration is also found attached to Defendant's Memorandum in Opposition to Motion to Strike Testimony of Eric L. Butler, Dkt. 84). That methodology was discussed in the articles as follows:

(a) Evaporation of gasoline in the subsurface produces a vapor phase that can also be beneficial in environmental forensic investigations. (Stout, et al., 2006, p. 499);

(b) The use of PIANO-type fingerprinting on soil gas vapors is discussed late in this chapter - as it is relevant to forensic investigation of subsurface gasoline impacts on indoor air. (Stout, et al., 2006, p. 499);

(c) In that peer-reviewed article cited by Dr. Butler, the use of vapor fingerprinting in this very context is discussed:

In the cases where subsurface gasoline (either LNAPL or dissolved phase) is suspected as the source of indoor air contamination, the findings of gasoline-related chemicals such as BTEX and MTBE does not necessarily mean that the subsurface is the source of these

chemicals. More detailed chemical fingerprinting is warranted if investigators wish to link subsurface gasoline contamination with hydrocarbons found in indoor air. (Stout, et al., 2006, p. 527).

This analysis, recommended in the peer reviewed Stout article and discussed and cited in Dr. Butler's Declaration, is the very methodology Dr. Butler employed in this case. (Def. Ex. 1000, ¶7; *see also* Trial Tr. Day 12 pm, p. 54, l. 12 - p. 56, l. 15).

Dr. Butler's analysis encompassed two different areas of Hartford. Opinion Four resulted from comparison of vapors underneath the Hartford Community Center with LNAPL while opinion Five results from comparison of vapors in East Watkins Street homes in May 2002 with LNAPL. The premise of these opinions was that if the LNAPL pool was the source of the vapor-phase hydrocarbons found in sub-slab (Hartford Community Center) and indoor air (East Watkins Street homes), respectively, then the ratios of constituents in the sub-slab and indoor air samples should resemble the ratios of the constituents present in the LNAPL pool.

Utilizing this established methodology, Dr. Butler analyzed the vapors from the LNAPL beneath the Community Center and compared them to the vapors detected underneath the Community Center. (Def. Ex. 586). The compounds for which Dr. Butler calculated vapor concentrations - butane, isobutane, pentane and isopentane - are significant components of gasoline vapors and have been identified as useful tracers in soil gas investigations. Ratios of these compounds in the vapors over the LNAPL were compared to ratios of Hartford Community Center vapor concentrations. Dr. Butler compared butane normalized concentrations of sub-slab vapors collected under the Community Center to vapors calculated from three nearby samples collected from the LNAPL on the groundwater. (Trial Tr. Day 12 pm, pp. 70-77). The composition of the sub-slab vapors was clearly different from that of the LNAPL's because the sub-slab vapors were significantly enriched in most compounds relative to butane. (*Id.*, at p. 77).

This enrichment of some compounds in the sub-slab vapor is not what would be expected if vapors originating from the LNAPL were the source. Interaction with subsurface material would tend to lead to depletion of the heavier molecules rather than enrichment. Because of this, Dr. Butler concluded that LNAPL could not be the source of the vapors measured under the Community Center. At trial, Dr. Butler testified as follows:

Q. Did your work in analyzing the LNAPL samples from beneath Hartford and comparing them to the vapors measured in the sub-slabs in the various samples beneath the Hartford Community Center lead you to develop an overall opinion with regard to whether the LNAPL pool could be the source of the vapors measured under the Hartford Community Center that were set forth in Dr. Weis' report?

A. Yes.

Q. And what is your opinion?

A. That they were not the source of the vapors measured in the sub-slab at the Hartford Community Center.

Q. And is that your opinion to a reasonable degree of certainty in the field of environmental forensics and environmental chemistry?

A. Yes.

(Trial Tr. Day 12 pm, p. 86, l. 25 - p. 87, l. 14).

Using this same type of methodology and analysis, Dr. Butler also compared vapors found within homes in Hartford with the composition of vapors that would be expected to form above the LNAPL under Hartford. (Def. Ex. 586). Specifically, Dr. Butler reviewed vapor data collected in homes on East Watkins in May 2002, following an odor event, and compared it to nearby Main Sand LNAPL vapors. Dr. Butler found that the vapors in the East Watkins homes were highly enriched in isopentane, isohexane and hexane relative to the Main Sand LNAPL vapors. 2,3,4-trimethylpentane, 2,2,4-trimethylpentane and cyclohexane were also enriched in the houses. (Trial Tr. Day 12 pm, pp. 46-54). Only butane showed a significant depletion in

three out of four samples. Because of this, Dr. Butler concluded that it was extremely unlikely that LNAPL vapors were the source of the East Watkins indoor air exceedances. (Trial Tr. Day 12 pm, pp. 48-57).¹

The methodology Butler employed is generally accepted in the scientific community as a valid environmental forensic tool. (Trial Tr. Day 12 pm, p. 54, l. 12 - p. 56, l. 15; Def. Ex. 1000, ¶¶3; ¶¶7-10). As stated above and in the previously-filed Memorandum in Opposition to Motion to Strike Testimony of Eric L. Butler, the methodology Dr. Butler employed in arriving at Opinions Four and Five, respectively, is the subject of a considerable number of scholarly articles and is hardly a novel approach to hydrocarbon fingerprinting. Scientists employed vapor analysis to evaluate subsurface hydrocarbons in similar fashion as Dr. Butler did here in each of the articles referenced below:²

- Extensive studies on the composition of light hydrocarbons present in the near-surface soil gases shows striking similarity to the compositions of the underlying known production. (Weismann, 1979; p. 370).
- Horvitz has examined tens of thousands of near-surface sediment samples from both onshore and offshore areas for the saturated hydrocarbons through pentane. Recognizable hydrocarbon distribution patterns were observed over known fields. (Weismann, 1979; p. 371).

¹ Dr. Butler concluded that the likely source of vapors detected along East Watkins in May 2002 was “[a] contemporaneous release that went into the sewer and from the sewer into the homes.” (Trial Tr. Day 12, pm, p. 56, l. 25 - p. 57, l. 4). Dr. Salhotra also studied the May 2002 vapor intrusion event on East Watkins. If the vapors were truly coming from the sub-surface, the intrusion event would not have lasted such a short period of time. (Trial Tr. Day 16, p. 70, ll. 10-13). Because of this, Dr. Salhotra concluded that the concentrations of hydrocarbons found in the homes on East Watkins in May 2002 were due to some localized temporary source. (Trial Tr. Day 16, p. 71, ll. 3-5).

² All of these articles, with the exception of the last one (Technical and Regulatory Guidance, Vapor Intrusion Pathway: A Practical Guideline), were also referenced in Apex Oil’s previous filing: Defendant’s Memorandum in Opposition to Motion to Strike Testimony of Eric L. Butler (at pp. 12-13).

- Extensive field work has demonstrated that the chemical compositions of near-surface hydrocarbon soil gases, measured by flame ionization gas chromatography, are largely determined by the hydrocarbons in nearby underlying reservoirs. By using compositions and ratios of the light hydrocarbons, methane, ethane, propane, and butane, one may predict whether oil or gas is more likely to be discovered in the prospect area. Near-surface hydrocarbons are best represented by normalized histograms of composition data. These histograms are strongly correlative with those of reservoir gas and with compositions of gas from shows recorded in downhole mud logging. (Jones and Drozd, 1983; p. 932).
- Fuel fingerprinting, performed by comparing soil-gas chromatograms with pure product chromatograms, is widely used to map volatile petroleum products in soil gas. (Marrin, 1988; p. 53).
- Although quantitative determinations of contamination levels are not possible, experienced workers in the field can evaluate sources, age, and migration of contaminants from soil-gas data. (Kerfoot, 1990; p. 160).
- Soil-gas contaminant concentration composition are the most useful data because they yield information about residual composition and the extent of contamination. (Johnson, *et al.*, 1990; p. 173).
- As early as 1975, oil industry scientists used the light gas composition of gasoline (butane dominance) to recognize interference from shallow gasoline contamination when conducting soil gas surveys in exploration areas. (Jones and Agostino, 1998).
- Recent work has focused on compositional ratios or signatures of the light hydrocarbon gases and their relationship to known hydrocarbon products and the investigated area. Compositional information in soil gases has been related to subsurface accumulations through the application of specific ratios. (Jones, *et al.*, 1999; p. 3).
- These light hydrocarbons (methane, ethane, propane and butanes) are the most volatile constituents present in gasoline, and other petroleum products. In addition to providing excellent tracers, these light hydrocarbon compounds also tend to dissipate more rapidly with time and/or distance from the point(s) at which petroleum constituents are introduced into the subsurface environment. Light hydrocarbon analyses thus provide very useful information for the identification and differentiation of natural gas, biogenic gas, gasoline, and many other refined petroleum products. (Jones and Agostino, 1998).

- Recent work has focused on compositional ratios or signatures of the light hydrocarbon gases and their relationship to known hydrocarbon products in the investigated area. Compositional information in soil gases has been related to subsurface accumulations through the application of specific ratios. (Jones, *et al.*, 1999, p. 3).

Further general acceptance of the Butler methodology is demonstrated by the work of Feenstra discussed in the Declaration (Def. Ex. 1000, ¶9). In a February 2006 article, Dr. Feenstra also used vapor-phase contaminant ratios to evaluate subsurface data. (Feenstra, S. 2006 “Use of logarithmic-scale correlation plots to represent contaminant ratios for evaluation of subsurface environmental data.” *Environmental Forensics* 7:175-185) (Def. Ex. 1000; Dkt. 84, Ex. 16). Dr. Feenstra used ratios of contaminants in vapor to compare deep vapors (analogous to the LNAPL vapor used by Dr. Butler), sub-slab vapor and indoor air. The article also described a case study using vapor ratios to determine the source of vapors in indoor air. No statistics were employed, needed or used by Feenstra in arriving at his findings of likely sources of contaminations in his examples. A graphical analysis, similar to the one employed by Dr. Butler, was deemed sufficient.

Plaintiff’s renewed and unsupported assertion that Dr. Butler “invented” a methodology of evaluating vapor data to gain insight into subsurface contamination or that using compound ratios and graphical analysis is a novel and untested approach is wholly inaccurate. For the second time, Plaintiff has attempted to cast doubt upon the reliability of a defense expert based solely upon the assertions of Mr. Spector. For example, Plaintiff asserts that the variability in the isopentane to butane (isopentane:butane) ratio renders “the ‘test’ itself invalid.” Plaintiff has (again) cited to no scholarly literature or expert testimony in support of such an assertion. While Apex Oil has produced a sworn declaration (Def. Ex. 1000) and citations to scholarly articles, Plaintiff has produced nothing but unsupported, conclusory scientific statements and legal

argument in an arena reserved for expert scientists. Mr. Spector is not an expert in the field. Accordingly, his opinions and assertions as to what should or should not be considered regarding the state of the art of hydrocarbon fingerprinting are immaterial.

Plaintiff argues that Dr. Butler lacks sufficient practical experience in measuring, anticipating, and assessing changes in hydrocarbon vapors as they pass through the subsurface to render an opinion that is not corroborated by a reference standard. Plaintiff cited no authority for this proposition as it relates to Dr. Butler's analysis. Instead, Plaintiff attempts to bootstrap the trial testimony of expert witness Dr. Nicholson for the proposition that a "reference standard" is needed. This argument fails. First, Dr. Nicholson's endeavor was entirely different from that of Dr. Butler. Dr. Nicholson was looking at the gasoline in the LNAPL pool, and attempting to determine if some portion of it was consistent with gasoline produced in a refinery that had an HF alkylation unit. To do this, he needed to compute TMP ratios, and felt he needed a TMP ratio for comparison purposes. Dr. Butler was doing something completely different. He was comparing vapors from the LNAPL pool directly to the vapors above the surface at the Hartford Community Center or on East Watkins. No "reference value" was needed since the comparison was directly between the two sources of vapors. Indeed, while Dr. Nicholson testified that he had reviewed the Butler report, he did not criticize Butler's technique or methodology. Thus, plaintiff's assertion that a reference value was needed is not based on literature or the testimony of any expert applying the Butler vapor fingerprinting analysis described in the literature cited by Dr. Butler. Rather, it is an unsubstantiated claim set forth in the brief. It is plaintiff's own argument which fails *Daubert*, not Butler's opinion.

Plaintiff also claims that Dr. Butler's opinion should be stricken, arguing that Dr. Butler did not adequately account for water washing is without merit. Again, the argument is not based on any scientific article or expert testimony, but merely on the assertion of counsel that Butler's comparative ratio analysis did not account for water washing. In fact, the opposite is true. As Dr. Butler testified, interactions of vapor phase hydrocarbons with subsurface material would tend to lead to depletion of the heavier molecules, rather than enrichment, which is what he found. (Trial Tr. Day 12 pm, pp. 49-53). Thus, by Dr. Butler's testimony, water washing was considered and did not change his opinions, despite plaintiff's unsubstantiated claims.

Finally, contrary to plaintiff's assertion, Dr. Butler's testimony is corroborated by proof from plaintiff's own witnesses. For example, David Webb of the Illinois Department of Public Health testified by deposition that the vapor intrusion of concern (i.e., containing benzene at levels of concern) in Hartford homes that were attributable to in home sources and were not from the LNAPL pool. (*See* the references cited in Defendant's Proposed Findings of Fact and Conclusions of Law, ¶294, ¶295, ¶301, ¶367, and ¶407). He further testified that IDPH could find no correlation between vapors containing VOCs and the LNAPL pool. (*Id.*) With regard to the Hartford Community Center, plaintiff's own lead witnesses conceded that the fuel spilled around the Hartford Community Center was diesel fuel that came from the Shell dock lines. (*Id.* at 546) and consisted of shallow spills related to current releases (*Id.* at 543). Dr. Butler's analysis was not only grounded in established science, but was consistent with plaintiff's own evidence.

It would be unprecedented to strike Dr. Butler's testimony and report on vapor fingerprinting, based as it is on scholarly work generally accepted in the field of environmental forensics, when the only points of attack are the unsupported claims of plaintiff, which are not supported by any scientific articles or principles, or the testimony of any witness directly refuting Dr. Butler. Plaintiff's motion should be denied.

II. Opinion 3. Dr. Butler's evaluation of groundwater elevation and weather event data and subsequent determination that the LNAPL pool on the groundwater table is not related to odor complaints and fires is a straight forward exercise in basic environmental forensics and the product of a reliable methodology.

Plaintiff's attack on Dr. Butler's correlation analysis is particularly misplaced, given plaintiff's extensive embrace of the proposition that there is a relationship between groundwater levels in Hartford and odor complaints. In its proposed findings and conclusions, Plaintiff made this connection repeatedly (*see* Plaintiff's Proposed Findings of Fact and Conclusions of Law, ¶¶215, ¶216, ¶217, ¶218, ¶219, ¶220, ¶221, ¶238, ¶253, ¶315, ¶317). In all these instances, the inference was drawn by the plaintiff based on reports from Hartford Working Group contractors that did not even identify an author (Clayton Group Services, ¶219; ENSR ¶¶220-221; "ESI", ¶218), or authors who admittedly were engaged in speculation, such as Catherine Dondanville of IDPH (¶238). None of the anonymous authors of the Hartford Working Group reports came to Court to testify as to their findings. Plaintiff simply submitted these reports into evidence. Of those who did testify, none had the credentials or training in environmental forensics of Dr. Butler (like Dondanville, ¶238; Faryan, ¶235; or Cahnovsky, ¶315). Plaintiff's argument that the Court should embrace its often anonymous evidence and find a connection between water table levels and odor complaints in Hartford, and reject out of hand as unscientific the opinions of a seasoned environmental forensic expert, is unfair and unwarranted. For the reasons set forth

above, the Court should not strike Dr. Butler's testimony on the lack of correlation between water levels and odor complaints under *Daubert*.

State and federal agencies involved in Hartford have long asserted the correlation between (a) rain events and/or rising groundwater levels, and (b) an increased incidence of odor and fire complaints attributable to the LNAPL pool or other historical subsurface hydrocarbons. In fact, Section III of the USEPA's Threat Memorandum specifically cites this alleged correlation as one of the "threats to public health or welfare." (Def. Ex. 14). To rebut this assumption, Apex Oil charged Dr. Butler with analyzing existing data in order to determine whether there is such a correlation. Dr. Butler's subsequent analysis of the purported correlation between groundwater levels and reports of odors and fires was also prompted by the frequency of reference to the alleged correlation in the documents Butler reviewed in forming his opinions. (Trial Tr. Day 12 pm, p. 4, l. 13 - p. 5, l. 1; *see also* pp. 5-7). Dr. Butler's examination of local groundwater elevation data and official weather data revealed no direct correlation between rain events and/or rising groundwater levels, and an increased incidence of odor and fire complaints attributable to subsurface LNAPL. (Trial Tr. Day 12 pm, p. 3, l. 20 - p. 4, l. 12).

Plaintiff commences its challenge of Dr. Butler's third opinion by denigrating the data he relied on in conducting his analysis and arriving at his opinion. To make such an argument at this point in the proceedings is disingenuous. This case has been based in large part upon historic data and documents, the accuracy and completeness of which are incapable of being ascertained. Furthermore, Plaintiff's experts, including its own hydrocarbon forensic analyst, relied on the same (or substantially similar) universe of documents and data as Dr. Butler in crafting their opinions. Because of this, Plaintiff cannot now challenge the data relied on by Dr.

Butler, or any other defense expert, without also questioning the data relied on by its own experts.

Instead of directly attacking Dr. Butler's methodology or analysis, Plaintiff merely summarizes historical documents in the case, such as the Mathes Report, that may reach conclusions not entirely consistent with Butler's. Plaintiff is attempting to pass such discrepancies off as evidence of Butler's failure to follow reliable methodologies when forming his opinion and/or hoping that the Court will draw such an inference.

As Dr. Butler stated in the Declaration of Eric L. Butler in Support of Defendant's Memorandum in Opposition to the United States' Motion to Strike Testimony of Eric L. Butler, the correlation analysis and accompanying graphical analysis that Butler performed was a relatively "basic exercise in environmental forensics." (Def. Ex. 1000, ¶5) (Trial Tr. Day 12 pm, p. 38, ll. 5-19). Environmental forensic scientists routinely look for correlations between variables when it is alleged that some type of cause and effect or corollary relationship occurs between them. (*Id.*) This technique and methodology is accepted in the scientific community. (*Id.*) In addition, the data relied on was comprehensive and extensive, largely compiled by governmental sources and more than sufficient to conduct the analysis. (*Id.*) Finally, the information Dr. Butler relied upon was of the kind customarily relied upon by environmental forensic scientists. (Trial Tr. Day 12 pm, p. 38, ll. 5-19). Once again, in the face of sworn testimony that Dr. Butler's environmental forensic methodology was proper, Plaintiff offers no rebuttal testimony from its own experts, or other literature, contradicting Dr. Butler. While this would be difficult given the Plaintiff's reliance on the very same kind of analysis, it is fatal to Plaintiff's argument.

Dr. Butler's consideration and comment upon Plaintiff-provided documents and data was also entirely proper. Plaintiff has attacked Dr. Butler's third opinion on its lack of citations to literature during analysis and discussion of whether a pattern should be expected between groundwater elevations and complaints of odors and fires. Because Plaintiff has drawn this connection in its own published documents, however, Dr. Butler is clearly allowed to consider the documents and render an expert opinion as to their own reliability.

Federal Rule of Evidence 703 permits an expert witness to base opinions primarily upon data provided by the opposing party's expert witnesses and state agencies. *Gussack Realty Co. v. Xerox Corp.*, 224 F.3d 85, 94-95 (2nd Cir. 2000). In *Gussack*, a defendant plant operator sought to exclude the testimony of plaintiffs' expert, arguing that plaintiffs' expert failed to conduct independent testing and inappropriately relied upon data provided for defendant's experts and a state environmental agency. *Id.* The Court held that an expert witness may express an opinion based upon data and information made available by the opposing party, without having to conduct independent tests. *Id.*

Plaintiff's continued reliance on *Rosen v. Ciba-Geigy Corp.*, 78 F.3d 316 (7th Cir. 1996), remains misplaced in that the challenged expert in the *Rosen* case and Dr. Butler in the instant case arrived at their opinions in an entirely different fashion. Simply put, no analogy may be drawn from a comparison between the two as Dr. Butler's opinions rest on a far firmer foundation. In *Rosen*, the challenged expert summarily concluded, without any support, that a causal relationship existed between the plaintiff's use of a nicotine patch and his heart attack. *Rosen*, 78 F.3d at 319. The challenged expert's sole basis for the opinion was a reference to a dog study finding that nicotine can contribute to the formation of plaque. *Id.* The expert was not able to elaborate on nor explain how he got from formation of plaque in dogs to heart attacks in

people. Dr. Butler has provided much more foundation to buttress his opinion and has never had difficulty in explaining his processes or how he arrived at his conclusion during his deposition or at trial.

Plaintiff's continued reliance on the *Zenith* case also remains misplaced. In *Zenith*, the challenged expert all but conceded that he had not applied reliable principles and methods, and that he employed no analytical strategies. *Zenith Elecs Corp. v. WH-TV Broad. Corp.*, 395 F.3d 416 (7th Cir. 2005). In this case, however, Dr. Butler, a scientist of 20 years, has provided a sworn declaration asserting the reliability of his proffered opinions - a declaration this Court saw fit to admit into evidence. Plaintiff has offered nothing to rebut this other than lawyers' arguments, unsupported speculation, and historical documents that may or may not arrive at a different conclusion than the one arrived at by Dr. Butler.

Plaintiff has cited to an ENSR report as model of proper environmental forensics in analyzing the asserted correlation between meteorological phenomena and reports of vapor intrusion. See Renewed Motion to Strike at 14, footnote 15, citing the ENSR report in Plf. Ex. 250. This report is hailed as authoritative because it considered barometric pressure, Mississippi River stage data and utilized statistical analyses. Plaintiff's reliance on this report illustrates the error of its argument. No witness testified that the ENSR report was more reliable than Dr. Butler's, or that its methodology was sound while Dr. Butler's was not. No witness from ENSR introduced the report in evidence and described its methodology. Not only did plaintiff fail to call the author of the ENSR report, but its author is not even identified in the document. The proposition that this kind of report should be deemed reliable, while Dr. Butler's should not, is not based on any scientific or expert testimony, but merely on the "*ipse dixit*" of plaintiff's counsel, who is neither an expert nor under oath. While the ENSR report had its methodology,

Dr. Butler's had its own, too, supported by sworn testimony that it was of a kind and nature routinely undertaken by experts in the field of environmental forensics. There is simply and flatly no basis in the record for the Court to embrace the ENSR report in Plf. Ex. 250, or the many other reports offered without expert support by plaintiff as to the correlation between water levels and complaints of vapors and fires, and reject Dr. Butler's and testimony on the same subject.

Dr. Butler has not drawn unsupported, bottom-line conclusions in arriving at his opinion that groundwater elevation and weather event data are not related to odor complaints and fires in Hartford. Rather, Dr. Butler has used reliable methods, supported by scholarly literature, to review and compare the existing universal data generated by the Plaintiff and its associates. After such a review and analysis, Butler determined that the number of complaints do not increase as groundwater elevations increase or during heavy rain events. Dr. Butler maintains that he has applied reliable principles and methods and the Plaintiff's dislike for Dr. Butler's theory and conclusions, or its inability to rebut them through its own experts, does not render Dr. Butler's opinion "junk science."

III. Opinion 6. Dr. Butler's determination that the subsurface LNAPL pool was not responsible for the rash of odor complaints and fires in the spring of 1990 is based upon his scientific and technical knowledge and is the product of a reliable methodology.

Plaintiff's prior challenge to Dr. Butler's sixth opinion was based on a mischaracterization of Dr. Butler's deposition testimony. Plaintiff's current challenge to Dr. Butler's sixth opinion is based on a mischaracterization, or at least a questionable interpretation of Dr. Butler's trial testimony.

Plaintiff's first contention is that Dr. Butler acknowledged having no expertise nor understanding of the mechanics by which the December 1989 Shell Oil release may have migrated to affected homes. For support, Plaintiff referenced only a portion of Dr. Butler's response to a confusing compound question. Plaintiff's factual assertion is misleading and incomplete. The entirety of the exchange is as follows:

Q. And your testimony is that -- that that spill could have gone into the pipeline corridor that runs west along Rand Avenue, correct?

A. A place of facilitative transport which would include a pipeline corridor which seems to be -- could be a sewer line, but it would be any type of underground conveyance like that.

Q. And when this spill occurs a volume of 300,000 (sic) what is your understanding of how that material is moving along that pipeline corridor area of facilitating transference? Are we talking a wave of gasoline rushing along it, or is it slower seeps? Can you help the Court visualize what your testimony is with regard to that?

A. I am not sure how it would look underground, depending -- It would depend on the nature of the release, the size of the hole, the flow rate of the gasoline. My recollection is that the flow rate of the pipe was pretty high and that initially the flow would be charged by the gasoline coming out of the pipe. Once that stopped, then it would flow under the force of gravity.

Q. Okay. And I believe you testified that it would flow along these corridors yesterday under the force of gravity, so it would continue down along the Rand Avenue pipelines and sewer lines west towards the Mississippi River, correct?

A. It would proceed in many directions, but including west.

Q. Well, would it proceed uphill?

A. It would not proceed uphill.

(Trial Tr. Day 13, p. 86, l. 2 - p. 87, l. 7).

Dr. Butler answered the questions he was asked. Plaintiff's mischaracterization of this line of questioning as an admission on the part of Dr. Butler that he has "no expertise or indeed understanding of the mechanics by which the Rand Avenue leak could have migrated to the affected homes" is misleading and without merit. In fact, throughout this entire line of questioning, the only admission elicited from Dr. Butler was that he did not know the exact path that the Shell Oil gasoline would have traveled in its migration from the release site to the Settles' house at 119 West Date Street. This admission does not damage Butler's opinion or render it void because knowledge of this exact path is not crucial to Dr. Butler's opinions, so long as he had an understanding of the possible places of facilitative transport.

Plaintiff appears to hang its hat on the argument that the Shell release could not be the cause of the vapor intrusion and fire event at 119 West Date, simply because the product took a meandering or roundabout route to the home instead of a direct shot. Once again, Plaintiff has produced no affidavits, literature, or testimony supporting why this is the case. Notwithstanding this, common sense alone dictates that a massive 294,000 gallon release of gasoline traveling through the subsurface and taking a roundabout path from the location of the release to its final destination is a more realistic and believable scenario than decades old released product vaporizing, creeping up through multiple soil layers and infiltrating a home.

Plaintiff's next critique is Butler's supposed misunderstanding of the term "impermeable." Plaintiff questions whether Dr. Butler is aware of the term's meaning and scientific significance by citing to testimony elicited from another defense expert, Manu Sharma. Plaintiff simply throws this out there for consideration without conducting any meaningful analysis, stating that Dr. Butler admitted that "impermeable" clay layers were, in fact, permeable. Plaintiff then cites to an exchange between counsel for Plaintiff and Sharma, in which Sharma

states that “from a scientific standpoint, ‘impermeable’ means it has a low permeability, but it doesn’t mean zero.” (Trial Tr. Day 14 pm, p. 114). Through this, Plaintiff concludes that Dr. Butler’s knowledge with regard to permeability is of a “lay person.” Plaintiff, however, produces nothing indicating that Dr. Butler’s understanding of relative permeability of soils differs from Manu Sharma’s understanding. This is a point that Plaintiff would have been better off exploring during Butler’s deposition or during cross-examination at trial.

Plaintiff also alleges that Dr. Butler lacks expertise in geology as evidenced by his attempt to use boring log notations to illustrate a lack of vapor phase hydrocarbons in various soil layers, but fails to elaborate further as to exactly how or why this demonstrates a lack of geology expertise. Butler merely used the boring log notions to further corroborate and buttress his opinion after reviewing local soil strata and ROST response data:

In addition, the LNAPL pool is separated from the homes in this area by 2 clay layers . . . The cumulative 15 feet (approximately) of clay serves as an effective barrier to vapors over the LNAPL pool. Figure 23 shows the thick clay layer in which the homes along Watkins Street reside. The figure also shows the general lack of ROST response in the borings along the street. Examination of the available boring logs (Table 6) is consistent with this statement. Table 6 describes the notations of odors during the boring of monitoring wells. In the majority of cases, odors were noted when the boring was very close to the LNAPL pool, and not while the boring was in the basement soil levels.

(Def. Ex. 586, pp. 12-13).

As is evident from Butler’s expert report excerpt laid out above, Dr. Butler relied on the boring log notations as further evidence of and support for his opinion.

IV. The substance of Plaintiff's Motion should have been advanced during its cross examination of Dr. Butler or elaborated on by Dr. Andrew Nicholson, Plaintiff's forensic expert, as rebuttal testimony.

As previously stated in this memorandum and its predecessor, the content of the United States' Renewed Motion to Strike Testimony of Eric L. Butler is the type of material better suited for use during a deposition or cross-examination. Unfortunately for Plaintiff, this was not thought of at the time or was attempted and unsuccessful. An honest reading of Plaintiff's brief shows that the challenge to Dr. Butler relates not to his methodology or analysis, but rather the substance of his conclusions.

Plaintiff's challenge is also made without citation to relevant scholarly literature and without the aid of sworn affidavits from other experts in the field. As stated previously herein, Plaintiff also fails to produce a declaration or significant substantive excerpt of trial testimony from its own hydrocarbon fingerprinting expert, Dr. Nicholson. What Plaintiff does reference, is unrelated snippets of trial testimony and several exhibits admitted into evidence the conclusions of which differ (sometimes only slightly) from those Dr. Butler expressed in his report and at trial. The only reason for Plaintiff's exclusive reliance on these type of documents and testimony is that there is simply nothing else out there that could discredit the methodology and analysis employed by Butler in arriving at his list of eight opinions and supporting report.

Conclusion

For the foregoing reasons, Apex Oil respectfully requests that the Court deny the United States' Renewed Motion to Strike Testimony of Eric L. Butler and give full weight to the opinions contained in Dr. Butler's expert report (Def. Ex. 586) and trial testimony.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on the 11th day of April, 2008, I electronically transmitted the foregoing document to the Clerk of Court using the ECF System for filing and transmittal of a Notice of Electronic Filing to the following ECF registrants:

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